



Basic MSFC Software Configuration

This chapter provides the basic Multilayer Switch Feature Card 2 (MSFC2) configuration information for the Cisco 7600 Optical Services Router (OSR). For more detailed configuration information, refer to the software configuration and command reference publications for the Cisco 7600 OSR.

For information about basic supervisor engine software configuration, see [Chapter 1, “Basic Supervisor Engine Software Configuration.”](#)

This chapter contains these sections:

- [Configuring the MSFC2, page 2-1](#)
- [Using the Global Configuration Mode, page 2-14](#)
- [Verifying the Running Configuration Settings, page 2-15](#)
- [Saving the Running Configuration Settings to NVRAM, page 2-19](#)
- [Reviewing the Running Configuration Settings, page 2-19](#)
- [Performing Other Configuration Tasks, page 2-21](#)

Configuring the MSFC2

The information in this section applies only if the system does not boot automatically on startup from a specified default Cisco IOS software image.

The MSFC2 in the Cisco 7600 OSR is administered by a command language interpreter called the EXEC. You must boot the MSFC2 and log in to the system before you can issue commands to the EXEC.

To access the MSFC2 from the supervisor engine, enter the **session** command in privileged mode:

```
Console> session 15
Trying Router-15...
Connected to Router-15.
Escape character is '^']'.
```

```
Router>
```

For security purposes, the IOS EXEC command line interface has two levels of access:

- User EXEC mode—On startup of the Cisco IOS software, the system displays the user EXEC mode prompt:

```
Router>
```

- Privileged EXEC mode—If you enter an enable secret password (which must first have been saved in memory) at the user EXEC mode prompt, the system changes to the privileged EXEC mode prompt (Router#), as follows:

```
Router> enable
password: xxxxxxxxxx
Router#
```

For more information about passwords, refer to [Step 4](#) and [Step 5](#) in the “[Configuring Global Parameters](#)” section on page 2-4.

You can perform a basic configuration for your Cisco 7600 OSR using either of these methods:

- Using the setup facility or the **setup** command.

At initial startup of a completely unconfigured OSR, the system automatically defaults to the setup facility, which enables you to begin manually configuring your router. The setup facility presents a structured, interactive script that guides you through the process of manually configuring your router.

You can invoke the setup facility at any time by entering the **setup** command at the privileged EXEC mode prompt (Router#), which makes available to you the same configuration script that appears automatically at initial startup of an unconfigured router. You can enter the **setup** command at any time if you need to alter some previously entered configuration information.

The setup facility is described in the “[Using the setup Facility or the setup Command](#)” section on page 2-3.

- Using the global configuration mode

If you do not want to use the interactive script of the setup facility to configure your router, you can configure your router manually using the global configuration mode. This facility requires you to enter configuration commands on a line-by-line basis at the console without being prompted by a configuration script. See the [“Configuring Global Parameters” section on page 2-4](#) for more information.

The advantage in using the setup facility is that the system guides you through the configuration process through an interactive script that minimizes the likelihood of errors.

To configure the Cisco 7600 OSR to operate in your networking environment, you will need to obtain the correct network addresses from your system administrator or your network plan.

Using the setup Facility or the setup Command

During the initial manual configuration of the Cisco 7600 OSR, you need to consider these parameters:

- Global (system-wide) parameters
- Network interface (module) parameters

You can establish these parameters using the setup facility. The setup facility displays automatically at initial system startup. You can also enter the **setup** command at any time at the privileged EXEC prompt (Router#) to activate the setup facility.

When you enter the **setup** command, the configuration script displays any existing (previously entered) system configuration defaults within square brackets [].

For example, during the configuration of a Packet-over-Sonet (POS) interface using the setup facility at startup (assuming that the interface has not previously been configured), you will see this display as you proceed through the script and respond to queries:

```
Configuring interface POS4/0:
Is this interface in use?: yes
Configure IP on this interface?: yes
```

No default or current parameters are enclosed within square brackets [] in the configuration dialog in this configuration.

When you enter the **setup** command at the privileged EXEC mode prompt (assuming that the POS interface has been previously configured and you are being queried by the system for changes), you will see this display:

```
Configuring interface POS4/0:
Is this interface in use?[yes]: yes
Configure IP on this interface?[yes]: yes
```

The default or current parameters that apply to the interface are enclosed within square brackets [].

Configuring Global Parameters

When you first enter the setup facility or enter the **setup** command, you are queried by the system to configure global parameters for the OSR MSFC.

To boot the system and establish global configuration parameters, perform these steps:

Step 1 Boot the system to display the user EXEC prompt (Router>).

After about 30 seconds, the following display appears on the console, indicating that you have successfully booted the system:

```
Cisco Internetwork Operating System Software
IOS (tm) MSFC2 Software (C6MSFC2-JSV-M), Version 12.1(5b)E7, EARLY
DEPLOYMENT RELEASE SOFTWARE (fc1)
TAC Support:http://www.cisco.com/cgi-bin/ibld/view.pl?i=support
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 09-Feb-01 19:28 by hqluong
Image text-base:0x30008980, data-base:0x3177A000

ROM:System Bootstrap, Version 12.1(3r)E2, RELEASE SOFTWARE (fc1)
BOOTFLASH:MSFC2 Software (C6MSFC2-BOOT-M), Version 12.1(5b)E7, EARLY
DEPLOYMENT RELEASE SOFTWARE (fc1)

cat6k-msfc uptime is 3 minutes
System returned to ROM by power-on
Running default software
cisco Cat6k-MSFC2 (R7000) processor with 491520K/32768K bytes of
memory.
Processor board ID SAD044407E3
R7000 CPU at 300Mhz, Implementation 39, Rev 2.1, 256KB L2, 1024KB L3
Cache
Last reset from power-on
```

```

Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
1 POS controller (4 POS).
1 Virtual Ethernet/IEEE 802.3 interface(s)
4 Packet over SONET network interface(s)
509K bytes of non-volatile configuration memory.

16384K bytes of Flash internal SIMM (Sector size 512K).
Configuration register is 0x2102

```



Note The first two sections of the above configuration script (containing the banner screen and the installed hardware listing) appear only at initial system startup. On subsequent uses of the **setup** command facility, the setup script begins with the following system configuration dialog.

```

--- System Configuration Dialog ---

```

```

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

```

```

Continue with configuration dialog? [yes/no]: yes

```

Enter yes when queried if you want to continue with the configuration dialog.



Note The examples in this section represent a continuation of the console display for the setup facility or the **setup** command.

Step 2 Enter **yes** when asked if you want to enter the initial configuration dialog and if you want to see the current interface summary:

```

Would you like to enter the initial configuration dialog? [yes]: yes

```

```

First, would you like to see the current interface summary? [yes]: yes

```

Pressing **Return** in either case accepts the default response [yes].

The following sample display results from a yes response to the current interface summary query that is entered while you are using the setup facility.

This display shows that no interfaces have been configured:

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0	unassigned	YES	unset	administratively down	down
POS3/0	unassigned	YES	unset	administratively down	down
POS3/1	unassigned	YES	unset	administratively down	down
POS3/2	unassigned	YES	unset	administratively down	down
POS3/3	unassigned	YES	unset	administratively down	down
ATM4/0	unassigned	YES	unset	administratively down	down

The following sample display results from a yes response to the current interface summary query that is entered while you use the **setup** command.

This display shows that some interfaces have already been configured:

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0	3.3.1.1	YES	NVRAM	up	up
POS3/0	2.1.1.1	YES	NVRAM	up	up
POS3/1	2.1.1.2	YES	NVRAM	up	up
POS3/2	2.1.1.3	YES	NVRAM	up	up
POS3/3	2.1.1.4	YES	NVRAM	up	up
ATM4/0	1.1.1.2	YES	NVRAM	up	up

Step 3 Select the protocols that you intend to support for your network interfaces.

For IP-only installations, you can accept the default values for most of the questions.

A typical minimum configuration procedure using IP follows and continues through Step 8:

Configuring global parameters:

Enter host name [Router]: **Router**

Step 4 Enter the enable secret password when prompted to do so:

The enable secret is a one-way cryptographic secret used instead of the enable password when it exists.

Enter enable secret [<Use current secret>]: **barney**

For future use, make a note of this password.

Step 5 Enter the enable password when prompted to do so:

The enable password is used when there is no enable secret and when using older software and some boot images.

```
Enter enable password: wilma
```

For future use, make a note of this password.

The commands available at the user EXEC level are a subset of those available at the privileged EXEC level. Because many privileged EXEC commands are used to establish system parameters, you should password protect these commands to prevent their unauthorized use.

The enable secret password functionality is available for the Cisco 7600 OSR. You must enter the correct password to gain access to privileged-level commands. When you are running from the ROM monitor (rommon>), the enable password can be used, depending on your boot ROM level.

For maximum security, the enable secret and the enable password should be different. If you use the same password for both the enable secret and enable functions during the setup process, the system accepts it but issues a warning indicating that you should enter a different password.

An enable secret password can contain from 1 to 25 uppercase and lowercase alphanumeric characters; an enable password can contain any number of uppercase and lowercase alphanumeric characters.

In either case, you cannot use a number as the first character. Spaces, however, are valid password characters. For example, “two words” is a valid password. Leading spaces are ignored, but trailing spaces are recognized.

Step 6 Enter the virtual terminal password when prompted to do so:

```
Enter virtual terminal password: bambam
```

For future use, make a note of this password.

Step 7 In most cases, you will use IP routing as the network layer protocol. If you specify IP, you must also specify an interior routing protocol.

Enter **yes** (the default) or press **Return** to configure IP. Do the same to select the Interior Gateway Routing Protocol (IGRP) as the interior routing protocol.

Specify the IGRP autonomous system number as follows:

```
Configure IP? [yes]: yes
Configure IGRP routing? [yes]: yes
Your IGRP autonomous system number [1]: 199
```

Step 8 Enter yes or no to the following query to accept or refuse Simple Network Management Protocol (SNMP) management:

```
Configure SNMP Network Management? [yes]:
Community string [public]:
```



Note SNMP is the most widely supported standard for managing networks. SNMP provides a means to access and set configuration and run-time parameters and to monitor and control network elements for routers and communication servers.

Step 9 Enter yes or no to the following query to accept or refuse Connectionless Network Service (CLNS) management:

```
Configure CLNS? [no]: yes
CLNS router tag [area_1]:
CLNS domain [49]:
CLNS area [0001]:
CLNS station id [0027.25E9.B640]:
```



Note CLNS is an Open System Interconnection (OSI) layer service that does not require a circuit to be established before transmitting data.

On completion of this procedure, you have successfully established the router's global configuration parameters.

Sample Display of Global Parameters

The following sample display lists the global parameters that you entered in Step 3 through Step 10 in the preceding section.

The display indicates the order in which the parameters and their defaults appear on your console terminal.

Configuring global parameters:

```
Enter host name: Router
Enter enable secret: barney
Enter enable password: wilma
Enter virtual terminal password: bambam
Configure IP?: yes
Configure IGRP routing?: yes
Your IGRP autonomous system number [1]: 199
Configure SNMP Network Management?: yes
Community string [public]:
Configure CLNS? [no]: yes
CLNS router tag [area_1]:
CLNS domain [49]:
CLNS area [0001]:
CLNS station id [0027.25E9.B640]:
```

Configuring Network Interfaces

This section contains the procedures for configuring the Layer 3 network interfaces for the modules installed in the Cisco 7600 OSR by using the setup facility or the **setup** command. After the interfaces are configured, the Cisco 7600 OSR can communicate with external networks.

To configure the Layer 3 interface parameters for the Cisco 7600 OSR, you need this information:

- Interface network addresses
- Subnet masks
- Protocols to be configured

For additional Layer 3 interface configuration information for each of the modules installed in your Cisco 7600 OSR, refer to the *Cisco 7600 Optical Services Router Software Configuration Guide*.



Note

The sample configuration dialog in this section continues the script displayed when you used the setup facility or the **setup** command in establishing the system global parameters (see the [“Configuring Global Parameters” section on page 2-4](#)). The output shown in this section is only an example; your configuration dialog might be different, depending on how you configure your router.

These sections describe how to configure the Layer 3 interfaces on the modules installed in the Cisco 7600 OSR:

- [Configuring the Gigabit Ethernet Interfaces, page 2-10](#)
- [Configuring the POS Interfaces, page 2-10](#)
- [Configuring the ATM Interfaces, page 2-11](#)
- [Verifying and Saving the Layer 3 Interface Configuration, page 2-11](#)

Configuring the Gigabit Ethernet Interfaces

The Layer 3 Gigabit Ethernet module WAN interfaces enable connections to external Gigabit Ethernet networks.

This example shows a configuration dialog for a four-port GE WAN Gigabit Interface Converter (GBIC) module. You should respond to the queries according to your configuration requirements. Use your IP address and subnet mask in responding to the setup prompts.

```
Configuring interface GigabitEthernet3/0:
Is this interface in use?: yes
Configure IP on this interface?: yes
Configure IP unnumbered on this interface?: no
IP address for this interface: 2.2.1.1
Number of bits in subnet field: 0
Class A network is 2.0.0.0, 0 subnet bits; mask is 255.0.0.0
Configure CLNS on this interface?: yes
```

For complete Gigabit Ethernet interface configuration information, refer to the *Cisco 7600 Optical Services Router Software Configuration Guide*.

Configuring the POS Interfaces

The POS module interfaces enable connections to external OC-3/STM-1 or OC-12/STM-4 networks.

This example shows a configuration dialog for an OC-3c POS module. You should respond to the queries according to your configuration requirements. Use your IP address and subnet mask when responding to the setup prompts.

```
Configuring interface POS4/0:
Is this interface in use?: yes
Configure IP on this interface?: yes
Configure IP unnumbered on this interface?: no
```

```
IP address for this interface: 2.1.1.1
Number of bits in subnet field: 0
Class A network is 2.0.0.0, 0 subnet bits; mask is 255.0.0.0
Configure CLNS on this interface?: yes
```

**Note**

For POS interfaces, the cyclic redundancy check (CRC) is 32 bits by default.

For complete POS interface configuration information, refer to the *Cisco 7600 Optical Services Router Software Configuration Guide*.

Configuring the ATM Interfaces

You can connect to external ATM networks using ATM interfaces.

This example shows an ATM interface being configured to use IP. Respond to the configuration dialog as appropriate for your configuration. Use your address and subnet mask for the setup prompts.

Configuring interface parameters:

```
Configuring interface ATM1/0:
Is this interface in use?: yes
Configure IP on this interface?: yes
IP address for this interface: 1.1.1.2
Number of bits in subnet field: 0
Class A network is 1.0.0.0, 0 subnet bits; mask is 255.0.0.0
```

**Note**

You might have to establish additional configuration parameters for the installed ATM modules if you want to fully utilize them. For more information on configuring the ATM WAN modules, refer to the *Cisco 7600 Optical Services Router Software Configuration Guide*.

Verifying and Saving the Layer 3 Interface Configuration

When you have completed entering the configuration information for all of the installed modules, the following configuration query is displayed:

```
Use this configuration? [yes/no]:
```

At this point, verify all of the configuration parameters that are displayed on your console terminal.

Answer **yes** if you want to save the running configuration file to NVRAM and display the following additional output:

```
Use this configuration? [yes/no]: yes  
[OK]
```

Use the enabled mode 'configure' command to modify this configuration. Press RETURN to get started!

After you press **Return**, the system reverts to the user EXEC prompt:

```
Router>
```

Answer **no** to the configuration query to return to the privileged EXEC mode prompt (Router#). You must reenter the **setup** command and enter the appropriate modules configuration information.

When you complete this procedure, you have manually configured the global system parameters and the network interface parameters using the setup facility or the **setup** command. Your Gigabit Ethernet, POS, and ATM interfaces are now available for limited use.

If you want to modify the currently saved configuration information (after you complete the preceding procedure), enter the **setup** command at the privileged EXEC mode prompt (Router#) at any time.

To perform more complex configuration tasks, you can enter the **configure** command at the privileged EXEC mode prompt (Router#), which establishes the global configuration mode [Router(config)#]. This mode is described in the [“Using the Global Configuration Mode” section on page 2-14](#).

Checking the IOS Software Version Number and the Installed Interfaces

To determine the current Cisco IOS software version running on the MSFC2 in the Cisco 7600 OSR, enter the **show version** command at the user EXEC prompt (Router>).

This command displays the Cisco IOS version number and other information, including the hardware installed in the system, the names and sources of system image files, and the contents of the software configuration register.

When you enter the **show version** command, the following typical display appears:

```
Router# show version
Cisco Internetwork Operating System Software
IOS (tm) MSFC2 Software (C6MSFC2-JSV-M), Version 12.1(5b)E7, EARLY
DEPLOYMENT RELEASE SOFTWARE (fc1)
TAC Support:http://www.cisco.com/cgi-bin/ibld/view.pl?i=support
Copyright (c) 1986-2001 by cisco Systems, Inc.
Compiled Fri 09-Feb-01 19:28 by hqluong
Image text-base:0x30008980, data-base:0x3177A000

ROM:System Bootstrap, Version 12.1(3r)E2, RELEASE SOFTWARE (fc1)
BOOTFLASH:MSFC2 Software (C6MSFC2-BOOT-M), Version 12.1(5b)E7, EARLY
DEPLOYMENT RELEASE SOFTWARE (fc1)

cat6k-msfc uptime is 3 minutes
System returned to ROM by power-on
Running default software

cisco Cat6k-MSFC2 (R7000) processor with 491520K/32768K bytes of
memory.
Processor board ID SAD044407E3
R7000 CPU at 300Mhz, Implementation 39, Rev 2.1, 256KB L2, 1024KB L3
Cache
Last reset from power-on
Bridging software.
X.25 software, Version 3.0.0.
SuperLAT software (copyright 1990 by Meridian Technology Corp).
TN3270 Emulation software.
1 POS controller (4 POS).
1 Virtual Ethernet/IEEE 802.3 interface(s)
4 Packet over SONET network interface(s)
509K bytes of non-volatile configuration memory.

16384K bytes of Flash internal SIMM (Sector size 512K).
Configuration register is 0x2102

Router#
```

Using the Global Configuration Mode

If you prefer not to use the interactive script of the setup facility, you can manually configure the Cisco 7600 OSR using the global configuration mode. The global configuration mode enables you to enter configuration commands on a line-by-line basis from the console terminal.

To configure your router using the configuration mode, perform these steps:

Step 1 Connect a console terminal to the console port.

Step 2 When asked if you want to enter the initial dialog, answer **no**. This causes the router to enter the user EXEC mode. After a few seconds, the user EXEC mode prompt (Router>) appears:

```
Would you like to enter the initial dialog? [yes]: no
Router>
```

At this prompt, enter the **enable** command to establish the privileged EXEC mode:

```
Router> enable
Router#
```



Note Configuration changes can be made only in the privileged EXEC mode.

Step 3 At the privileged EXEC mode prompt, enter the **configure terminal** command to enter the global configuration mode:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

At the global configuration mode prompt, enter the **interface** command to enter the interface configuration mode:

```
Router(config)# interface gigabitEthernet 5/1
Router(config-if)#
```

In either the global configuration mode or the interface configuration mode, you can change the router configuration parameters.

To exit either mode, type **Ctrl-Z**.

- Step 4** Save your configuration settings, as described in the [“Saving the Running Configuration Settings to NVRAM”](#) section on page 2-19.
-

Your router is now minimally configured and able to boot using the currently established configuration information.

To display a list of the configuration commands available to you, enter a question mark (?) at the global configuration mode prompt (Router (config)#).

Verifying the Running Configuration Settings

You may want to verify the running configuration settings or any changes made to the running configuration settings before they are saved. To do so, enter the **show running-config** command at the privileged EXEC mode prompt.

Typical output from this command is shown in the following sections:

- [Example of Running Configuration Settings for a Gigabit Ethernet WAN Interface, page 2-15](#)
- [Example of Running Configuration Settings for an OC-3 POS Interface, page 2-16](#)
- [Example of Running Configuration Settings for OC-12 POS Interface, page 2-17](#)
- [Example of Running Configuration Settings for OC-12 ATM Interface, page 2-18](#)

Example of Running Configuration Settings for a Gigabit Ethernet WAN Interface

The **show running-config** command typically displays the following output for an OC-3c/STM-1c POS interface installed in slot 7:

```
Router# show running-config
Building configuration...

Current configuration :2381 bytes
!
```

```

version 12.1
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router
!
!
interface GigabitEthernet5/1
  no ip address
  shutdown
  no negotiation auto
  no cdp enable
!
interface GigabitEthernet5/2
  description b2b connection to osr1(g7/2)
  ip address 1.5.0.2 255.255.0.0
  no keepalive
  no negotiation auto
  no cdp enable
!
!
line con 0
  exec-timeout 0 0
  transport input none
line vty 0 4
  login
!
end

Router#

```

Example of Running Configuration Settings for an OC-3 POS Interface

The **show running-config** command typically displays the following output for an OC-3c/STM-1c POS interface installed in slot 7:

```

Router# show running-config
Building configuration...

Current configuration:
!
version 12.1

```



```
no service pad
no service udp-small-servers
no service tcp-small-servers
!
hostname Router
!
enable secret 5 $1$W6K5$W/p5Bq6IPLGJ/hS9VVP1g.
enable password lab
interface POS7/0
  ip address 11.1.1.1 255.255.255.0
  crc 32
  clock source internal
!
interface POS7/1
  no ip address
  no ip route-cache cef
  no ip route-cache
  shutdown
  crc 32
!
interface POS7/2
  no ip address
  no ip route-cache cef
  no ip route-cache
  shutdown
  crc 32
!
interface POS7/3
  no ip address
  no ip route-cache cef
  no ip route-cache
  shutdown
  crc 32
!
```

Example of Running Configuration Settings for OC-12 POS Interface

The **show running-config** command typically displays the following output for an OC-12 POS interface installed in slot 6:

```
Router# show running-config
Building configuration...

Current configuration:
```

```

!
version 12.1.
no service pad
no service udp-small-servers
no service tcp-small-servers
!
hostname Router
-----!
enable password lab
!
no ip domain-lookup
ip host ray 172.27.136.253
ip host crusty 171.69.209.28
!
!
interface POS6/0
  ip address 12.1.1.1 255.255.255.0
  crc 32
!

```

Example of Running Configuration Settings for OC-12 ATM Interface

The **show running-config** command typically displays the following output for an OC-12 ATM interface installed in slot 6:

```

Router# show running-config
Building configuration...

Current configuration:
!
version 12.1
no service pad
no service udp-small-servers
no service tcp-small-servers
!
hostname Router
-----!
enable password lab
!
no ip domain-lookup
ip host ray 172.27.136.253
ip host crusty 171.69.209.28
!
!

```

```
interface POS6/0
  ip address 12.1.1.1 255.255.255.0
  crc 32
!
```

Saving the Running Configuration Settings to NVRAM

To save the running configuration settings to NVRAM, enter the following command at the privileged EXEC mode prompt (Router#):

```
Router# copy running-config startup-config
```

As an alternative, you can also use the following command to save the running configuration settings:

```
Router# write memory
```

Either command saves to NVRAM the configuration settings that you created while in the global configuration mode.

If you fail to take this step, your configuration settings will be lost the next time you reload the system.

Reviewing the Running Configuration Settings

To display the running configuration settings stored in NVRAM, enter the **show startup-config** command at the privileged EXEC mode prompt. This command displays the following output:

```
Router# show startup-config
Using 1133 out of 520184 bytes
!
version 12.1
no service udp-small-servers
no service tcp-small-servers
!
hostname Router
!
enable password wilma
ip cef distributed switch
ip host biff 3.3.3.254
!
```

```
interface POS3/0
  ip address 2.1.1.1 255.0.0.0
  no keepalive
  crc 16
  no cdp enable
!
interface POS3/1
  ip address 2.1.1.2 255.0.0.0
  no keepalive
  crc 16
  no cdp enable
!
interface POS3/2
  ip address 2.1.1.3 255.0.0.0
  no keepalive
  crc 32
  no cdp enable
!
interface POS3/3
  ip address 2.1.1.4 255.0.0.0
  no keepalive
  crc 32
  no cdp enable
!
interface GigabitEthernet5/1
  no ip address
  shutdown
  no negotiation auto
  no cdp enable
!
interface GigabitEthernet5/2
  description b2b connection to osr1(g7/2)
  ip address 1.5.0.2 255.255.0.0
  no keepalive
  no negotiation auto
  no cdp enable
!
interface ATM4/0
  ip address 15.0.0.15 255.0.0.0 secondary
  ip address 1.1.1.2 255.0.0.0
  atm pvc 1 0 64 aal5snap
  atm pvc 2 0 72 aal5mux ip 155000 155000 1
  atm pvc 3 1 90 aal5snap 312000 312000 1
  atm pvc 4 0 108 aal5snap
  atm pvc 10 0 144 aal5mux ip 155000 155000 1
  atm pvc 11 1 91 aal5snap 310000 310000 1
  map-group atm1
!
```

```
no ip classless
ip route 2.5.4.254 255.255.255.255 Ethernet0
!
map-list atm1
ip 1.1.1.1 atm-vc 1
ip 1.1.1.3 atm-vc 2
ip 1.1.1.4 atm-vc 4
ip 15.0.0.1 atm-vc 3
ip 15.0.0.5 atm-vc 10
ip 15.0.0.6 atm-vc 11
no logging trap
!
!
line con 0
exec-timeout 0 0
line aux 0
line vty 0 4
password bambam
login
!
end
```

Performing Other Configuration Tasks

This section describes the procedures for performing these additional configuration tasks:

- [Configuring the Software Configuration Register, page 2-22](#)
- [Recovering a Lost Password, page 2-26](#)

Configuring the Software Configuration Register

The software configuration register is a 16-bit register in NVRAM that you use to define specific system parameters. You can set or change the contents of this register to accomplish these tasks:

- Define boot sources for the default Cisco IOS software, assigning them in the following order of precedence:
 - Flash memory card inserted in PCMCIA slot 0
 - TFTP server in the network
 - Flash memory SIMM (NVRAM) on the GRP
 - Boot image stored within the operating environment, which you access by means of an appropriate form of the **boot** command issued at the ROM monitor prompt (rommon>)
- Define a default boot filename.
- Enable or disable the Break function.
- Control broadcast addresses.
- Set the console terminal baud rate.
- Recover a lost password.
- Force an automatic boot using a boot image.
- Read boot system commands from the configuration file stored in NVRAM.

The factory default value for the software configuration register is 0x0102. This value is a combination of the following: binary bit 8 = 0x0100 and binary bits 00 through 03 = 0x0002.



Caution

To avoid confusion, note that valid software configuration register values may be combinations of settings. For example, the factory default value 0x0102 for the software configuration register is actually a composite of settings in this register.

Configuring Boot Field Settings and Using the Boot Command

The four low-order bits of the software configuration register (bits 3, 2, 1, and 0) form a boot field that defines the source of a Cisco IOS software image for booting the Cisco 7600 OSR.

You can set or change the contents of the boot field by entering the **config-register** command at the global configuration mode prompt [Router(config)#].

The factory default setting for the software configuration register is 0x0102.

When the boot field is set to either 0 or 1 (0-0-0-0 or 0-0-0-1), the system ignores any boot instructions in the system configuration file and one of the following occurs, depending on the boot field setting:

- When the boot field is set to 0, you must boot the system manually by entering the **boot** command at the ROM monitor prompt (rommon>). You can enter the **boot** command with or without arguments.

If you enter the **boot** command without an argument (that is, without specifying a file or any other boot instructions), the system automatically boots using the default image in the Flash memory SIMM.

If you enter the **boot** command with arguments (that is, by instructing the system to boot from a specific source), these options are available to you:

- You can instruct the system to boot from a specific Flash SIMM image (by entering the **boot system flash filename** command), or you can instruct the system to boot from a specific image stored on a PCMCIA Flash memory card.
- You can instruct the system to boot from a network TFTP server either by sending broadcast TFTP requests (by entering a **boot system filename** command), or by sending a direct request to a specific network TFTP server (by issuing a **boot system filename ip-address** command).
- When the boot field is set to 1, the system automatically boots using the first image found in the onboard Flash SIMM.

If you set the boot field to any bit pattern other than 0 or 1, the router uses the software configuration register settings to create a filename from which to boot a default system image stored on a network TFTP server.

To create this filename, the system starts with the name `cisco` and links the octal equivalent of the boot field value and the processor type in this format:

```
cisco<bootfieldvalue>--<processorname>
```

If the configuration file contains boot instructions, the system uses these instructions to boot the system instead of using the filename it created from the software configuration register settings.



Note

If a bootable Cisco IOS software image exists in a Flash memory card inserted in PCMCIA slot 0 or slot 1, the software configuration register boot field setting is overridden and the system boots from the Cisco IOS software image in the Flash memory card, instead of from a network TFTP image.

Changing the Software Configuration Register Settings

To change the software configuration register settings while running system software, perform these steps:

- Step 1** Enter the **enable** command and your password at the user EXEC mode prompt to establish the privileged EXEC mode:

```
Router> enable
Password:
Router#
```

- Step 2** Enter the **configure terminal** command at the privileged EXEC mode prompt to establish the global configuration mode:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

- Step 3** Set the contents of the software configuration register by entering the **config-register** *value* command at the global configuration mode prompt, where *value* is a hexadecimal number preceded by 0x.

The **config-register** *value* command takes this form:

```
Router(config)# config-register 0xvalue
```


- Step 4** Exit the global configuration mode by pressing **Ctrl-Z** or entering the **end** command:

```
Router(config)# config-register 0xvalue
Router(config)# end
Router#
```

The new contents of the software configuration register are saved to NVRAM. These new settings do not take effect until you reload the system or reboot the router.

- Step 5** To display the software configuration register setting that is currently in effect as a result of Step 3 (and which will be used at the next reboot of the router), enter the **show version** command at the privileged EXEC mode prompt:

```
Router# show version

.
.
.

#Configuration register is 0x141 (will be 0x102 at next reload)
```

The last line of the display shows both the current configuration register setting and the new setting that will take effect when the system is reloaded or rebooted.

- Step 6** Save the software configuration register setting, as described in the [“Saving the Running Configuration Settings to NVRAM”](#) section on page 2-19.

- Step 7** Reboot the router.

The software configuration register setting takes effect only after you reload the system, such as when you enter the **reload** command from the console or reboot the router.

This completes the procedure for changing the contents of the software configuration register. You can set the boot field to enable any desired manual or automatic boot function.

Setting the Boot Field Bits in the Software Configuration Register

The four low-order bits in the software configuration register (bits 3, 2, 1, and 0) comprise the boot field. This field specifies a number in binary form.

If you set the boot field value to 0, you must boot the system manually by entering the boot command at the ROM monitor prompt (rommon>).

If you set the boot field value to 0x2 through 0xF and a valid boot system command is stored in the configuration file, the system boots the Cisco IOS software image as directed by that value. If no boot system command is present in the configuration file, the system computes a default boot filename for booting from a network TFTP server.

In the following example, the software configuration register has been set to boot the system from the Flash memory SIMM and to ignore the Break function at the next reboot of the router:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# config-register 0x0102
Router(config)# boot system flash [filename]
Ctrl-z
Router#
```

With the configuration register set to “0x0102,” the system creates a default boot filename. In forming this filename, the system starts with the name cisco and appends the octal equivalent of the boot field number, a hyphen, and the processor type.

Recovering a Lost Password

This section tells you how to recover a lost password.



Note

If the enable password is encrypted, the following procedure will not work for password recovery and you will have to reconfigure the system before attempting a reboot. To reconfigure the system, use the displayed configuration obtained by entering the **show startup-config** command in the privileged EXEC mode.

To recover a lost password, perform these steps:

-
- Step 1** Attach an ASCII terminal to the console port.
 - Step 2** Configure the terminal to operate at 9600 baud, 8 data bits, no parity, and 2 stop bits (or to whatever settings the console port is currently set).

- Step 3** Enter the **show version** command at the privileged EXEC mode prompt to display the current software configuration register setting:

```
Router# show version
```

```
.  
. .  
. .
```

Make a note of this current configuration setting, as displayed in the last line of the **show version** command output. You may need this value for later use.

- Step 4** If the Break function is disabled, power cycle the router by turning off power to the power supply, waiting 5 seconds, and then restoring power.

If the Break function is enabled, press the **Break** key or send a break signal by holding down the **Ctrl** key and pressing the right square bracket key (^]).

- Step 5** Within 5 seconds of power being restored to the router, press the **Break** key. This action causes the terminal to display the ROM monitor prompt, as follows:

```
rommon 1>
```

- Step 6** Change the software configuration register setting to 0x0040. This setting causes the system to ignore the contents of NVRAM, allowing you to see your password.

- Step 7** Initialize the router by entering the **initialize** command at the ROM monitor prompt:

```
rommon 1> initialize
```

The router power cycles, the software configuration register is set to ignore the configuration file, and the router boots the system image and displays the system configuration dialog:

```
--- System Configuration Dialog ---
```

```
.  
. .  
. .
```

- Step 8** Enter **no** in response to the system configuration dialog prompts until the following instruction is displayed:

```
Press RETURN to get started!
```

- Step 9** Press **Return**.

After the interface configuration information is displayed, the user EXEC mode prompt appears:

```
Router>
```

- Step 10** Enter the **enable** command at the user EXEC mode prompt to enter the privileged EXEC mode:

```
Router> enable
Router#
```

- Step 11** Enter the **show start-up config** command at the privileged EXEC mode prompt to display the enable password in the configuration file:

```
Router# show start-up config
```

```
.
.
.
```

- Step 12** Enter the **configure terminal** command at the privileged EXEC mode prompt to enter the global configuration mode:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

- Step 13** Change the software configuration register setting back to its original value. Alternatively, change this value to 0x0102 (the factory default) by entering the **config-register value** command:

```
Router(config)# config-register 0xvalue
Router(config)#
```

- Step 14** Exit the global configuration mode by pressing **Ctrl-Z** or entering the **end** command.

```
Router(config)# end
Router#
```

- Step 15** Reboot the router and enable it using the recovered password.
-